

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 2, 4, and 5. No new matter is believed to be introduced by the aforementioned amendments. The following listing of claims will replace all prior versions and listings of claims in the application.

1. **(Currently Amended)** A method for performing OTDM, said method comprising the following steps:

- a) generating n bit streams of approximately B Gb/s from respectively n tunable laser beams having respectively wavelengths of $\lambda_1, \lambda_2, \dots$ and λ_n ;
- b) generating from said n bit streams n group velocity dispersed bit streams by introducing group velocity dispersion into said n bit streams;
- c) combining said n group velocity dispersed bit streams into a composite bit stream of approximately nB Gb/s; and
- d) in response to misalignment of bits within said composite bit stream, tuning said $\lambda_1, \lambda_2, \dots$ and λ_n to create ~~the proper~~ OTDM time differential between consecutive bits within said composite bit stream.

2. **(Currently Amended)** The method of Claim 1, further comprising the following steps:

- e) generating a single-wavelength composite bit stream of approximately wavelength λ_v and nB Gb/s by operating on said composite bit stream with a wavelength converter; and
- f) in response to misalignment of bits within said single-wavelength composite bit stream, tuning said $\lambda_1, \lambda_2, \dots$ and λ_n to create ~~the proper~~ OTDM time differential between consecutive bits within said single-wavelength composite bit stream.

3. **(Original)** An OTDM transmitter, comprising:

a) n channels of bit streams D₁, D₂, ... and D_n having respectively wavelengths of λ_1 , λ_2 , ... and λ_n , wherein for j = 1 to n, the j-th channel comprises:

j1) a tunable laser source S_j providing a bit stream B_j of approximately B Gb/s; and

j2) a group velocity dispersive element E_j coupled to said S_j, introducing group velocity dispersion into said B_j to generate said D_j;

b) a combiner coupled to said n channels and adapted to optically combine said D₁, D₂, and D_n into a composite bit stream of approximately nB Gb/s; and

c) a wavelength converter coupled to said combiner and adapted to convert said composite bit stream into a single-wavelength composite bit stream of approximately nB Gb/s to be transmitted through an optical link, wherein OTDM time differential can be created between consecutive bits of said single-wavelength composite bit stream by tuning λ_1 , λ_2 , ... and λ_n .

4. **(Currently Amended)** A method for performing OTDM transmission, said method comprising the steps of:

a) generating n bit streams of approximately B Gb/s from respectively n tunable laser beams having respectively initial wavelengths of λ_1 , λ_2 , ... and λ_n ;

b) generating n group velocity dispersed bit streams by introducing group velocity dispersion into said n bit streams;

c) combining said n group velocity dispersed bit streams into a composite bit stream of approximately nB Gb/s;

d) generating a single-wavelength composite bit stream of wavelength λ_v by wavelength converting said composite bit stream with a wavelength converter;

e) in response to misalignment of bits within said single-wavelength composite bit stream, tuning said λ_1 , λ_2 , ... and λ_n to create the proper OTDM time differential between consecutive bits within said single-wavelength composite bit stream; and

f) transmitting said single-wavelength composite bit stream by launching said single-wavelength composite bit stream into an optical transmission link.

5. **(Currently Amended)** A WDM system, comprising:

a) m OTDM channels, wherein for k = 1 to m, the k-th OTDM channel comprises:

kl) n channels V_{kl}, V_{k2}, ... and V_{kn} providing respectively bit streams D_{kl}, D_{k2}, ... and D_{kn} having respectively wavelengths of λ_{kl} , λ_{k2} , ... and λ_{kn} , wherein for j = 1 to n, the j-th channel V_{kj} comprises:

 kj 1) a tunable laser source S_{kj} providing a bit stream B_{kj} of approximately B Gb/s; and

 kj2) a group velocity dispersive element E_{kj} coupled to said S_{kj}, introducing group velocity dispersion into said B_{kj} to generate said D_{kj};

 k2) a combiner coupled to said n channels and adapted to optically combine said n bit streams into a composite bit stream U_k;

 k3) a wavelength converter coupled to said combiner and adapted to convert said composite bit stream into a single-wavelength composite bit stream A_k of wavelength λ_{vk} , wherein the proper OTDM time differential can be created between consecutive bits of said A_k by tuning λ_{kl} , λ_{k2} , ... and λ_{kn} ; and

 b) a WDM multiplexer coupled to said m OTDM channels, with said WDM multiplexer adapted to generate a composite optical signal with a data rate of approximately mnB Gb/s.

6. **(Original)** An OTDM subsystem for performing optical time-division-multiplexing, said OTDM subsystem comprising:

a) n channels of bit streams D₁, D₂, ... and D_n having respectively wavelengths of λ_1 , λ_2 , ... and λ_n , wherein for j = 1 to n, the j-th channel comprises:

 j 1) a tunable laser source S_j providing a bit stream B_j of approximately B Gb/s; and

 j2) a group velocity dispersive element E_j coupled to said S_j, introducing group velocity dispersion into said B_j to generate said D_j;

 b) a combiner coupled to said N channels and adapted to optically combine said D₁, D₂, and D_n into a composite bit stream of approximately nB Gb/s, wherein OTDM time differential can be created between consecutive bits of said composite bit stream by tuning λ_1 , λ_2 , ... and λ_n .

7. **(Previously Presented)** The method according to claims 2 or 4, wherein return-to-zero (RZ) format is used in generating bit streams.

8. **(Previously Presented)** The method according to claims 1, 2 or 4, wherein said B Gb/s is 10 Gb/s, and wherein said n is 4.

9. **(Previously Presented)** The method according to claims 1, 2 or 4, wherein said B Gb/s is 40 Gb/s, and wherein said n is 4.

10. **(Previously Presented)** The device according to claims 3 or 5, wherein said wavelength converter is a vertical lasing semiconductor optical amplifier (VLSOA), and wherein said single wavelength is generated from the vertical lasing of said VLSOA.

11. **(Previously Presented)** The device according to claims 3 or 5, wherein said wavelength converter uses four-wave mixing.

12. **(Previously Presented)** The device according to claims 3 or 5, wherein said wavelength converter is a MZ-SOA.

13. **(Previously Presented)** The device according to claims 3 or 5, wherein said wavelength converter is a SOA.

14. **(Original)** The method of Claim 1, wherein said n bit streams are generated by modulating respectively n CW tunable laser sources.

15. **(Original)** The method of Claim 1, wherein said n bit streams are generated respectively by n directly modulated tunable laser sources.

16. **(Original)** The OTDM transmitter of Claim 3, wherein for said j=1 to n, said Sj in said j-th channel is a CW tunable laser that is coupled to a modulator Mj, said Mj modulating a laser beam Lj generated by said Sj into said Bj.

17. **(Original)** The OTDM transmitter of Claim 3, wherein for said j=1 to n, said Sj in said j-th channel is a tunable laser that is directly modulated.

18. **(Original)** The method of Claim 4, wherein said n bit streams are generated by modulating respectively n CW tunable laser sources.
19. **(Original)** The method of Claim 4, wherein said n bit streams are generated respectively by n directly modulated tunable laser sources.
20. **(Original)** The WDM system of Claim 5, wherein for k=1 to m and j = 1 to n, said tunable laser source Skj in said j-th channel V_{kj} is a tunable CW laser source that is coupled to a modulator M_{kj}, said M_{kj} modulating a laser beam L_{kj} produced from said Skj into said stream B_{kj}.
21. **(Original)** The WDM system of Claim 5, wherein for k=1 to m and j = 1 to n, said tunable laser source Skj in said j-th channel V_{kj} is a tunable laser that is directly modulated.
22. **(Original)** The OTDM subsystem of Claim 6, wherein for said j=1 to n, said S_j in said j-th channel is a CW tunable laser that is coupled to a modulator M_j, said M_j modulating a laser beam L_j generated by said S_j into said B_j.
23. **(Original)** The OTDM subsystem of Claim 6, wherein for said j=1 to n, said S_j in said j-th channel is a tunable laser that is directly modulated.